Smart Temp

SMT-700 Installer Manual

Ver 3.0

Great effort has been taken to making the SMT-700 thermostat system intuitive, reliable and easy to install. Using a common sense approach to the installation will ensure the product is installed easily and to the customer's satisfaction. Please read and understand this instruction manual so that installation, testing and commissioning process is undertaken in an efficient and effective manner. This manual is to be used in conjunction with the user manual.

Installation

As with any air conditioning project undertaken, careful installation is the key to a successful outcome. Time taken during this installation process will be rewarded by a happy customer and fewer call-backs.

The steps required to install the SMT-700 thermostat are

1. Read and understand this manual.
2. Install the SMT-700 hardware.
3. Set the DIP switches on the main PCB to match the need of the project / user.
4. Wire the wall controller and optional remote temperature sensor(s) to the main PCB.
5. Wire the zone / outside air dampers to the main PCB.
6. Power up the air conditioning system.
7. Set the installer software options (if required).
8. Program and set up the wall thermostat. (The User Manual will assist with this).
9. Test the heating, cooling and other functions – Commissioning.

For convenience the layout of this manual is in the same order as the steps listed above

Setting the hardware switches

The first 5 switches are used to control the heating & cooling and air conditioning system. The following three are not essential for correct equipment operation and relate to user functions.

(The drawing on page 3 shows the location of the Function Selection DIP switches on the main PCB.)

A/C Equipment Control Settings	**SW1- Fan Speed Select**
	Switch On = 3 speed Fan Relay G1 = Low, G2 = Med, G3 = High
	Switch Off = Single Speed Fan. Relay G1 only (Relays G2 & G3 are not used)
	
	SW2- SMT-700 Equipment Control Method.
	Switch On = Heat Pump (Compressors with reversing valve)
	Switch Off = Heat with add on Cool (Y used exclusively for cooling & W used exclusively for heating)
	
	SW3- Equipment Stages
	Switch On = Multistage equipment control
	Switch Off = Single Stage equipment control (Y2 & W2 outputs disabled)
	
	SW4- Various
	<u>If SW 2= ON - Heat Pump Mode</u>
	      Switch On = Reversing Valve energises in HEAT mode (B)
	      Switch Off = Reversing Valve energises in COOL mode (O)
	<u>If SW 2= OFF – Heat Cool Mode</u>
	      Switch On = Fan in Heat called by thermostat (HE)
	      Switch Off = Fan in Heat **NOT** called by thermostat (HG)
	
	SW5 Compressor Anti Cycle Delay Timer
	Switch On = 4 Min Delay on break timer (anti-cycle).
	Switch Off = Time Delay Off

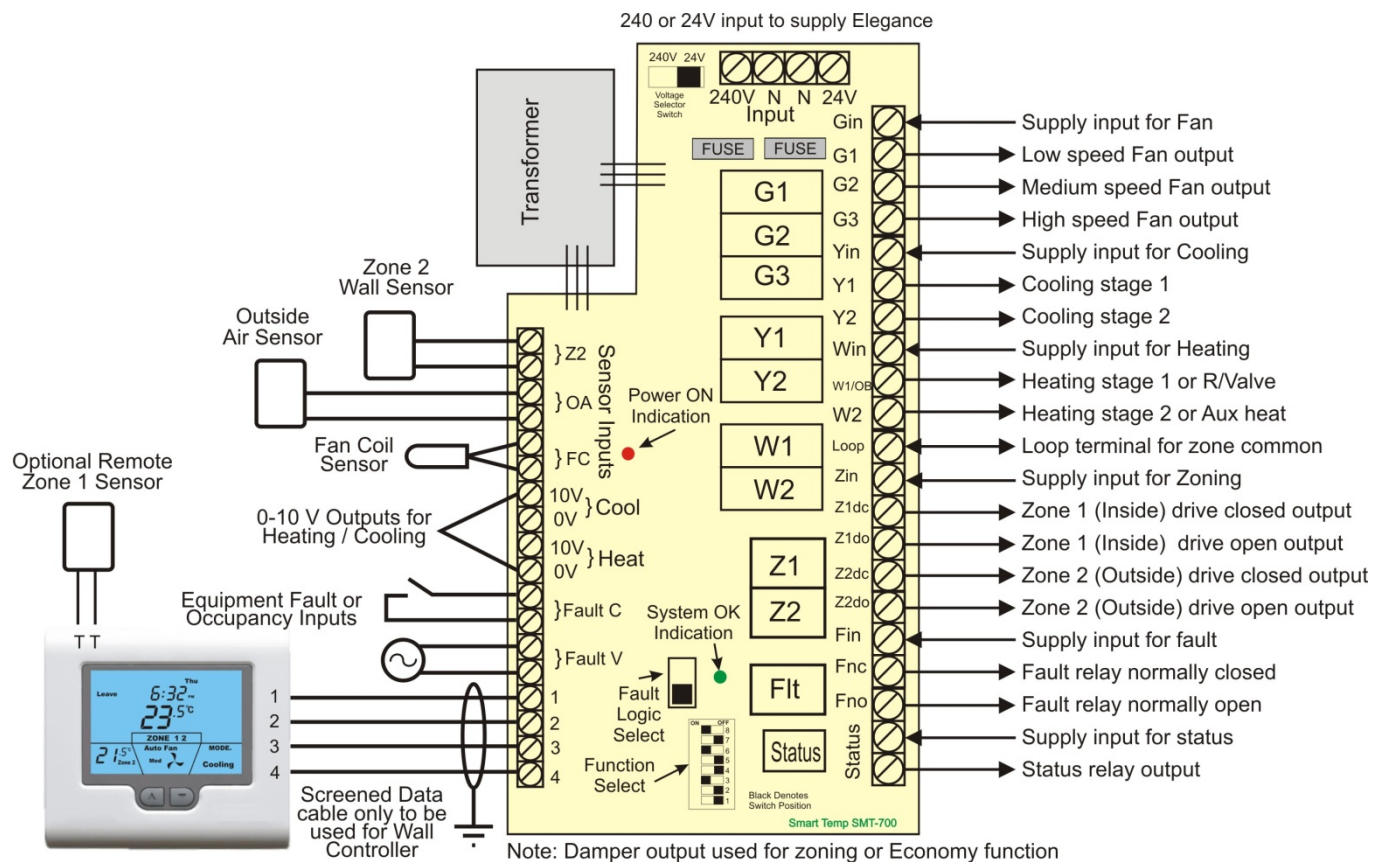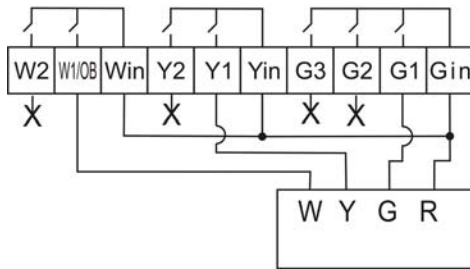|	

User Comfort / Control Options	**SW6 Thermostat Type**
	Switch On = Programmable Thermostat mode (See User Manual - Programmable Mode)
	Switch Off = Manual Thermostat Mode (See User Manual - Manual Mode)
	
	SW7 - Climate Zoning Mode (See User Manual - Zoning)
	Switch On = Zoning enabled
	Switch Off = Zoning disabled
	
	SW8 – Daily Events
	If Switch 6 =ON (Programmable thermostat mode)
	       Switch 8 On = Residential Programming. 4 events per day (Wake / Leave / Return / Sleep)
	       Switch 8 Off = Commercial Programming. 2 events per day (Start / Stop)
	
	If Switch 6 =OFF (Manual thermostat mode)
	       Switch 8 On = 2 Individual set point groups (Day & Night Manual Mode)
	       Switch 8 Off = 1 event Manual Mode

Wiring

Wiring Overview

An overall view of the SMT-700 input and output wiring has been provided below. More detailed wiring examples have been provided on the following page.

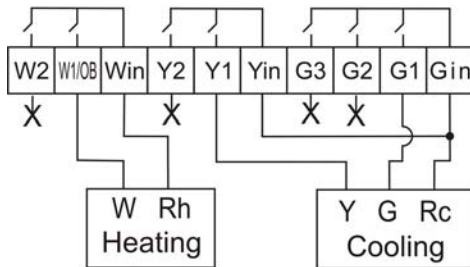## 1 stage gas / oil heating & with add on cooling systems. 1 fan speed

W2	W1/OB	Win	Y2	Y1	Yin	G3	G2	G1	Gin

W Y G R

	Recommended Switch Setting	
1	Fan Speed	OFF 1 Fan Speed
2	AC Type	OFF Heat Cool Mode
3	# Stages	OFF 1 Stage
4	R-Valve / Fan	OFF Gas / Oil Heating
5	Comp Delay	Check Equipment Needs
6	Mode	As per customer requirements
7	Zoning	As per customer requirements
8	Events	As per customer requirements

If three fan speeds are required and supported by the heating and or cooling system, turn sw1 on (fan speed select) and connect equipments medium and high fan speeds to G2 & G3 terminals on the SMT -700 main PCB respectively.

For 2 heat or cool, turn Sw 3 on (Stage number select) and use Y2 & W2 for second stage cooling and heating.

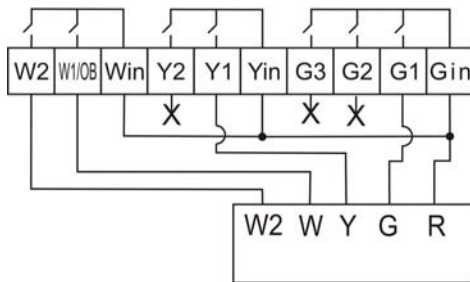## 1 stage gas / oil heating & with separate cooling systems. 1 fan speed

W2	W1/OB	Win	Y2	Y1	Yin	G3	G2	G1	Gin

W Rh Heating   Y G Rc Cooling

	Recommended Switch Setting	
1	Fan Speed	OFF 1 Fan Speed
2	AC Type	OFF Heat Cool Mode
3	# Stages	OFF 1 Stage
4	R-Valve / Fan	OFF Gas / Oil Heating
5	Comp Delay	Check Equipment Needs
6	Mode	As per customer requirements
7	Zoning	As per customer requirements
8	Events	As per customer requirements

If three fan speeds are required and supported by the heating and or cooling system, turn sw1 on (fan speed select) and connect equipments medium and high fan speeds to G2 & G3 terminals on the SMT -700 main PCB respectively.

For 2 heat or cool, turn Sw 3 on (Stage number select) and use Y2 & W2 for second stage cooling and heating.

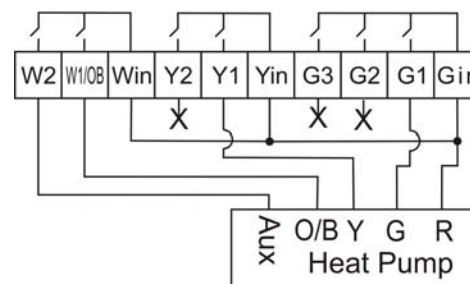## 2 stage gas / oil heating & with add on cooling systems. 1 fan speed

W2	W1/OB	Win	Y2	Y1	Yin	G3	G2	G1	Gin

W2 W Y G R

	Recommended Switch Setting	
1	Fan Speed	OFF 1 Fan Speed
2	AC Type	OFF Heat Cool Mode
3	# Stages	OFF 1 Stage
4	R-Valve / Fan	OFF Gas / Oil Heating
5	Comp Delay	Check Equipment Needs
6	Mode	As per customer requirements
7	Zoning	As per customer requirements
8	Events	As per customer requirements

If three fan speeds are required and supported by the heating and or cooling system, turn sw1 on (fan speed select) and connect equipments medium and high fan speeds to G2 & G3 terminals on the SMT -700 main PCB respectively.

If 2 stage cooling is required, connect the second cooling stage to Y2

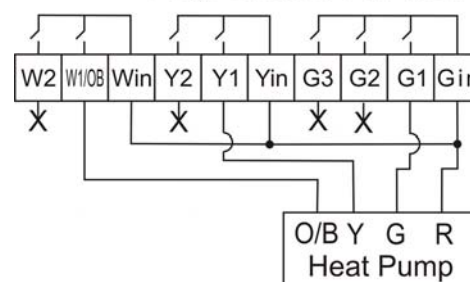## 1 stage heat pump with Aux Heat 1 fan speed

W2	W1/OB	Win	Y2	Y1	Yin	G3	G2	G1	Gin

Aux O/B Y G R Heat Pump

	Recommended Switch Setting	
1	Fan Speed	OFF 1 Fan Speed
2	AC Type	ON Heat Pump Mode
3	# Stages	OFF 1 Stage
4	R-Valve / Fan	On= Heat (B) Off= Cool(O)
5	Comp Delay	Check Equipment Needs
6	Mode	As per customer requirements
7	Zoning	As per customer requirements
8	Events	As per customer requirements

If three fan speeds are required and supported by the A/C system, turn sw1 on (fan speed select) and connect equipments medium and high fan speeds to G2 & G3 terminals on the SMT -700 main PCB respectively.

For 2 Stage Heat pump operation, turn Sw 3 on (Stage number select) and use Y2 for second stage compressor.

1 stage heat pump 1 fan speed

W2	W1/OB	Win	Y2	Y1	Yin	G3	G2	G1	Gin

O/B Y G R Heat Pump

	Recommended Switch Setting	
1	Fan Speed	OFF 1 Fan Speed
2	AC Type	ON Heat Pump Mode
3	# Stages	OFF 1 Stage
4	R-Valve / Fan	On= Heat (B) Off= Cool(O)
5	Comp Delay	Check Equipment Needs
6	Mode	As per customer requirements
7	Zoning	As per customer requirements
8	Events	As per customer requirements

If three fan speeds are required and supported by the heating and or cooling system, turn sw1 on (fan speed select) and connect equipments medium and high fan speeds to G2 & G3 terminals on the SMT-700 main PCB respectively.

Wiring 0-10V outputs
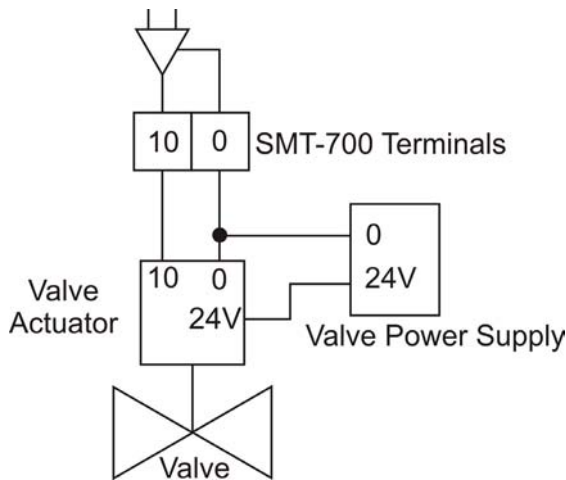
The SMT-700 has a separate floating 0-10 volt output for both heating and cooling that operate in parallel with the relay heating and cooling outputs. Whenever the SMT-700 makes a heating or cooling call, the corresponding 0-10V output is also on.

This permits you to mix and match your control logic to suit the application, such as a modulated chilled water valve for cooling and On/Off electric heating elements for heating.

The advanced installer option on page 9 details how you are able to "span" the range of the 0-10 output of the SMT-700 to suit your particular needs.
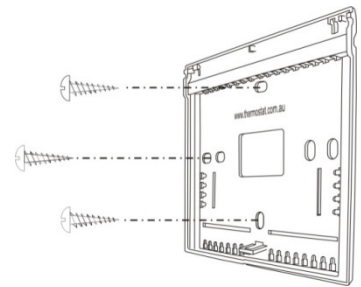
Wall Controller

Mounting the wall controller

The SMT-700 can only be as accurate as the temperature sensor fitted to the wall controller, or its optional remote temperature sensor(s) permit. It is therefore essential that the wall controller be installed in a location that is typical of the ambient room temperature. Do not install the wall controller in a draft, near a floor, behind doors or on a non-insulated external wall. Also avoid placing the wall controller in areas where the air movement is limited, affected by direct sunlight or other areas not "typical" of the temperature of the room.

Further, when mounting the SMT-700 be aware that drafts may travel down the inside of cavity walls, (especially if mounted on external walls) and enter the back of the wall controller or sensor enclosure through the cable entry holes in the wall. It is important to fully seal these holes to prevent any drafts affecting the internally mounted temperature sensor. It is recommended to mount the SMT-700 or remote sensors between 1.5 & 1.7 metres from the floor where possible.

Move the control wires through the large opening in the thermostat base plate then place the thermostat base on the wall and using appropriate screws, firmly attach the thermostat base to the wall. Seal any holes where cables enter the back of the thermostat.

The SMT-700 wall controller must be wired to the main PCB fitted in the air conditioner using 4 core screened cable **ONLY**. Smart Temp cable P/N GA-MC74S100 is available in 100m rolls and is recommended for this wiring. The screen on the cable must be grounded at one end only to eliminate spurious noise corrupting the data stream.

Wall controller wiring schedule	
Wall Controller Terminal Number	Main PCB Terminal Number
1	1
2	2
3	3
4	4

Maximum cable run is realistically limited to a cable loop resistance of 20 ohms. Using Smart Temp P/N GA-MC74S100 cable this is aproximately150 meters. Absolute maximum cable run under ideal conditions is 1,000 meters.

One the wiring is complete in the wall controller back plate; the wall controller can be assembled. Ensure the fold down button cover is attached to the front of the SMT-700 (so you have the two remaining pieces attached together, the plastic lid and the wall controller containing the LCD and electronics). Align the top the thermostat (with the lid attached) so that the mounting lugs on the top of the thermostat mate with the holes in the top of the base plate. Swing the lower section of the wall controller onto the base that is mounted to the wall until it clips securely closed.

Take careful note that the internally mounted room sensor will not jam between the two case halves when snapping the case together - this may damage the temperature sensor.

Backup battery.
A backup battery is provided inside the wall controller. This batteries ONLY function is to keep the clock running during power outage. The battery life is typically 5-10 years in normal service. Replacement batteries can be obtained from your authorised Smart Temp service centre or other reputable battery supplier. Part Number CR-1220.

Using a remote temperature sensor
If using a remote temperature sensor rather than the fitted wall controller temperature sensor attach the cables to this sensor and to the terminals marked "TT" in the wall controller base plate. The SMT-700 will auto detect this sensor and disable the on board temperature sensor. Common figure "8" cable is suitable for this provided the sensor runs are not extraordinarily long (> 30m) or unavoidably run past high voltage cable or electrically noisy environments.

As the wall controller "Auto detects this remote sensor and uses it when available, placing an On/Off switch in line with the remote sensor permits it to be turned On or Off from a remote location. For example, the SMT-700 wall controller may be mounted in an office reception with a remote temperature sensor mounted in a board room. Switching the temperature sensing locations between the board room and reception can then be achieved with an inline switch.
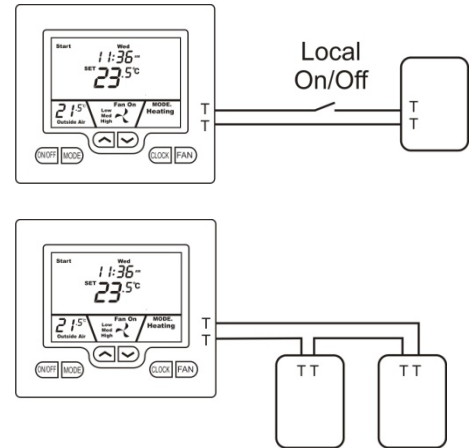
Multiple remote sensors can be used where the temperature averaging of a larger area is required.

More examples of sensors configurations are given on page 13

Zoning
Note: - Zone control function cannot be used when the Outside air function is used.

Dip switch #7 MUST be <u>ON</u> for zone control to operate.

The SMT-700 is capable of actively controlling two separate temperature controlled zones. The optional Zone 2 temperature sensor is required if the second zone is to be temperature controlled. The optional zone 2 sensor is Smart Temp P/N H-RS-01. The zone two temperature sensor is a two wire sensor and is fitted to the Z2 terminals on the main PCB. If this sensor is fitted correctly and the zoning function has been turned on (SW7=On) the zone two temperature will be displayed on the LCD.

The LCD will show which zone is active and the zone 2 temperature if the optional zone 2 sensor has been fitted.

To change the active zone tap the On/Off button to cycle through Zone 1 only, Zone 2 only then both Zones. You are not able to close both zones simultaneously.

Status LED's are provided on the main PCB to show which zones are open.

The zone damper relay contact rating is 5A @ 240VAC maximum. You are permitted to wire multiple zone dampers in parallel if required provided the contact rating is not exceeded. Note. Some brands of zone dampers cannot be wired in parallel due to "damper feedback". Damper feedback will cause the dampers to continually move open and closed regardless of the SMT-700 relay status. Check with your damper provider to ensure suitability for parallel connection before using this type of damper.

The SMT-700 active zoning function will open and close zone dampers and turn heating and cooling on or off as required to ensure that <u>all zone that are on</u>, are kept at their desired temperature. The SMT-700 does NOT simply average zone temperatures resulting in area's that are too hot or cool.

As a consequence of this advanced zone management method there may seem to be unusual delays before heating or cooling starts. The SMT-700 has time delays in place that provide adequate time for zone dampers to move to their correct position prior to starting the heating or cooling. When commissioning the zoning system patience may be required as some delays are up to 4 minutes in length to give zone dampers time to move and fun run on delays time to expire.
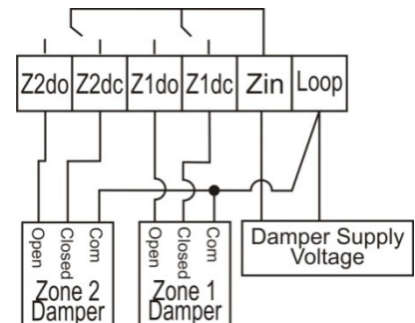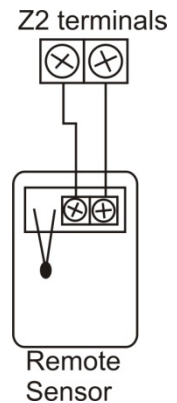
Outside Air Economy
Note:- Outside air function cannot be used when the zone control function is used.

**Dip switch #7 MUST be <u>OFF</u> for the Economy function to operate.**

The SMT-700 has an integrated outside air economy function that when used, will take advantage of cooler outside air to cool the building. The optional outside air temperature sensor will be required. P/N H-RS-01

The Zone 1 & Zone 2 dampers are used to control the outside air economy dampers.

To activate the outside air economy function
1. Turn Dip switch #7 to OFF (Zoning disabled)
2. Fit the required outside air temperature senor to the "OA" terminals on the main PCB.
3. Enter the Installer menu and set the OA function to on. See the installer menu on page 7 for more information on setting this function.
   (Note: You will not be able to complete step 3 if steps 1 & 2 are not yet complete).
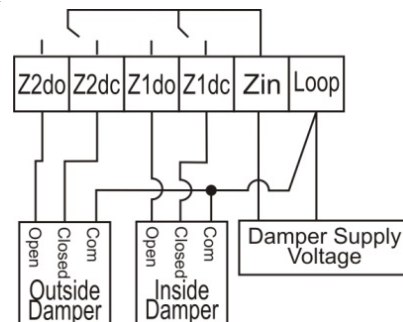
If economy mode is used, the following 4 states of cooling can exist.

<u>Cooling NOT required</u>
Inside Damper is Open.
Outside Damper is Closed.
Compressors Off.
Fan as set by user. (On or Off).

<u>Normal Cooling</u> - Outside air is less than 2 deg C cooler than the inside air temperature.
Inside Damper is Open.
Outside Damper is Closed.
Compressors run.
Fan running.
"Cooling" is shown in the LCD.

<u>Stage 1 Economy -</u> Outside air is least 2deg c cooler than the inside air temperature.
Inside damper closed.
Outside damper open.
Compressors run.
Fan running.
"Cooling" & "Economy" is shown in the LCD

<u>Stage 2 Economy -</u> Outside air is least 6 deg c cooler than the inside air temperature.
Inside damper closed.
Outside damper open.
Compressors OFF.
Fan running.
"Cooling" & "Economy" is shown in the LCD

The zone damper relay contact rating is 5A @ 240VAC maximum. You are permitted to wire multiple zone dampers in parallel if required, such as a indoor relief damper provided this contact rating is not exceeded. Note. Some brands of zone dampers cannot be wired in parallel due to "damper feedback". Damper feedback will cause the dampers to continually move open and closed regardless of the SMT-700 relay status. Check with your damper provider to ensure suitability for parallel connection before using this type of damper.

Advanced Installer Software Functions.

Note:- in almost all but a few cases will the functions in this menu need to be altered from their default state.

The SMT-700 has a PIN protected menu that permits the installer to "fine tune" the SMT-700 for the specific requirements of the installation or to enable / disable various functions as specifically required for the project.

Entering Installer Mode

If not already, turn the SMT-700 on with the On/Off Button.

Next, press and hold the Mode button for 30 seconds. After 30 seconds the SMT-700 LCD will show "*88:15*". Using the (▲) or down (▼) buttons adjust this number to show "*88:21*" (factory default) or to the PIN value that you have previously set.

Tap the Mode button. If the 2 digit PIN has been entered correctly the LCD will show the first menu item in the installer menu. If the PIN is incorrect you will be exited from this menu.

When in the advanced installer menu you will be automatically exited if no buttons are pressed for 60 seconds.

The menu items are shown in their order of appearance below. Tapping the mode button will advance you through the menu options. Tapping or holding the up (▲) or down (▼) buttons permit the values to be adjusted. The default values for this menu are shown in the examples below.

PN= 21 Set Pin

This is the PIN to enter installer mode in future attempts. This menu item permits the user to set their own PIN if they do not wish to use the factory default PIN of 21.

Caution -   **If this PIN value is changed and forgotten you will not be able to re-enter the Installer menu and the wall controller must be returned to Smart Temp or approved service centre to be unlocked. There may be a fee for this service.**

LC= 00 Keyboard Lock

The SMT-700 is fitted with a keyboard lock to prevent unauthorised tampering. When the keyboard lock is active the padlock symbol will be displayed on the LCD. When a locked button has been pressed the padlock will flash to inform the user the desired function has been locked.

LC= 00 Key board Lock OFF
LC= 01 Key board Lock ON Level 1
LC= 02 Key board Lock ON Level 2

Level 1 Lock
    In Programmable mode - All SMT-700 buttons are locked.
    In Manual mode - all SMT-700 buttons EXCEPT the on / off button are locked.
Level 2 Lock
    In Programmable mode - All SMT-700 buttons EXCEPT the ON/OFF button are locked.
    In Manual mode - all SMT-700 buttons EXCEPT the ON / OFF and temperature up (▲) or Temperature down (▼) button are locked.

TD= 00 Temperature Display Mode

The SMT-700 can hide the current room temperature if required and only display the set temperature for the current operational mode. If the SMT-700 is heating, or the last mode was heating the SMT-700 will only display the heating set temperature (Not current room temperature). If the SMT-700 is cooling, or the last mode was cooling the SMT-700 will only display the cooling set temperature (Not current room temperature).

If TD= 00 then the SMT-700 will display both the Room Temperature & Set Temperature
If TD= 01 the SMT-700 will display set temperature only.

$C1= 00$ Zone 1 Calibration Function

The SMT-700 main zone temperature sensor is extremely accurate and as such it should never need to be calibrated. You should exhaust all other explanations for perceived temperature inaccuracies before making any adjustments to the SMT-700 temperature sensor. The range of adjustment is +/- 3c

$C2= 00$ Zone 2 Calibration Function

The SMT-700 zone two temperature sensor is extremely accurate and as such it should never need to be calibrated. You should exhaust all other explanations for perceived temperature inaccuracies before making any adjustments to the SMT-700 temperature sensor. The range of adjustment is +/- 3c

$AO= 01$ Analogue Output Span

The SMT-700 permits you to "Span" the range of the 0-10v heating and cooling outputs. The AO=XX value is the temperature away from set point where the output will be at 10V. The output is liner from 0v (heating and cooling off) to AO=XX value where the output is 10V. The range of adjustment is 1 to 9c.

$CF= C$ Display Units

This sets the SMT-700 display units as Celsius "C" or Fahrenheit "F" for all user menu's and most installer menus.

$CT= 00$ Manual Count Down Time Value

Note: This function only operates in manual mode (SW6=Off)
The SMT-700 can be set to automatically switch the air conditioning off in CT=XX hours, adjustable from 0 to 8.
This feature is useful in installations where the air conditioning should only run for a limited time, or where an area is used infrequently – such as training rooms for example. The installer can set an Auto Off time, so that "XX" hours after the SMT-700 is turned on it will automatically switch itself off again.
Range of adjustment 0 & 8 hours (00= Countdown timer function is off)

$HL= 30$ Heating Limit Set point

The SMT-700 can limit the maximum permitted heating set temperature if required. This may reduce energy costs by the installer setting realistic values. When the user sets the Heating temperature that equals the HL=XX value the padlock symbol on the LCD will flash indicating the maximum permitted heating set temperature has been reached. The range is 00(off) ~30c

$CL= 15$ Cooling Limit Set point

The SMT-700 can limit the minimum permitted Cooling set temperature if required. This may reduce energy costs by the installer setting realistic values. When the user sets the Cooling temperature that equals the CL=XX value the padlock symbol on the LCD will flash indicating the minimum permitted cooling set temperature has been reached. The range is 15~37c (off)

$SD= 02$ Stage Delays

This value sets the temperature difference in deg C (F) between 1st & 2nd stages of heating and cooling, and 2nd & 3rd stages of heating. This value is adjustable between 1 & 3 deg.

$OS= 00$ Adaptive Recovery. (Optimised Start)

Adaptive Recovery or optimised start compares the differences between the current set point, the room temperature and the outside air temperature (if OA sensor is fitted) to determine the most energy efficient time to start the heating, cooling or Air conditioning system to ensure the room is at the set point by the event start time.
OS=00 Optimised start is off. (The heating or cooling will start (or stop) at the event time)
OS=01 Optimised start is on. (The heating or cooling system will start (or stop) before the event time to achieve the desired temperature by the event time) (If Outside Air Sensor Fitted)

FO= O2 Indoor Fan Options.

This function is enabled only when the fan mode is Fan On ."FAN ON" will be displayed in the LCD
The SMT-700 has the capability to control the indoor fan in a number of intelligent ways. These abilities are described below.

Option 0	The fan will run continuously - 100% of the time, 24 hours a day 7 days a week. (Note: If you wish the fan to cycle on & off with the heating and cooling calls all the time set the fan mode to Auto fan "Auto fan will be displayed in the LCD)
Option 1.	The fan will run continuously while in cooling mode to ensure the maximum fresh air ventilation and to aid in cooling (i.e the fan will continue to run when cooling stops) but automatically change modes to cycle the fan on and off when the last mode is heating. (This is done to prevent cold drafts that may occur on cold days when A/C system is heating).
Option 2. (Default).	Available only if the SMT-700 is in a Programmable Mode. The Fan will Run continuously from the Wake (or Start) Program to the sleep (or Stop) program and then run in AUTO mode overnight to maintain the night time set points. This ensures sufficient ventilation during the daytime occupied hours and quiet energy efficient comfort overnight.
Option 3.	Available if the SMT-700 is in Programmable Mode Only. This mode is the combination of option 1 and option 2 given above.

PZ= OO Zone Programming

Should it be desired, the SMT-700 will permit the user to program zone(s) to automatically change at the same times as the various daily events. This will permit the user to program the sleep zone to turn on when the sleep program begins for example. When this function is enabled the SMT-700 adds an extra step to the programming sequence
PZ=00 Program zone function is off.
PZ=01 Program zone function is on.

FS= OO Fan Speed Limit

Note: This function only operates when zoning is enabled (SW7=On) and only when fan speed is set to 3 speed mode (SW1=On). To protect the ducting, fan motors and other pressure sensitive components, if required the installer can disable the use of high-speed indoor fan when only one zone is on (either zone 1 or zone 2). The fan can run in high speed only when both zones are on.
FS=00 High-speed fan anytime
FS=01 High-speed fan only when both zones are on. (Led Z1 & Z2 on main PCB lit)

FN= OA Equipment Mode

The SMT-700 can control both heating and cooling systems. However, there may be situations where the SMT-700 is to control a Heating only system, or a Cooling only system. In these circumstances the SMT-700 can be set to heat only or to cool only modes to eliminate user confusion. In the heat or cool only mode all reference to the non-used mode is removed from the mode selection button and all programming and temperature selecting functions etc.
In heating only mode, the mode button toggles between heat and fan only. In cooling only mode, the mode button toggles between cool and fan only.
Fn=A Auto mode (Both Heating & Cooling control).
Fn=C Cool only mode (Heating function and options disabled).
Fn=H Heat only mode (Cooling function and options disabled).

TC= 12 Clock Mode

The SMT-700 has both a 12 hour, am/pm style clock or a 24hour military style clock.
TC = 12 AM/PM clock type
TC = 24 Military style 24 hour clock type.

FF= 1 Fault Fan (Occupancy Mode Fan control method)
The function of the Fault Inputs (Flt C & Flt B) can be changed to become an "occupancy input"
FF is the function you wish the fan to implement when the Flt C or Flt V inputs are active.
FF=0 Fan is OFF when the fault / occupancy input is active.
FF=1 Fan is locked to low speed when the fault / occupancy input is active. (Default)
FF=2 Fan is locked to Med speed when the fault / occupancy input is active.
FF=3 Fan is locked to High speed when the fault / occupancy input is active.
FF=A Fan is locked to Auto speed when the fault / occupancy input is active.

FH= -- Fault Heat (Occupancy Mode Heating Temperature)
The function of the Fault Inputs (Flt C & Flt B) can be changed to become an "occupancy input"
FH is the heating temperature you wish to maintain when the Flt C or Flt V inputs are active.
Range is "—" (off) to 37c

FC= -- Fault Cool (Occupancy Mode Cooling Temperature)
The function of the Fault Inputs (Flt C & Flt B) can be changed to become an "occupancy input"
FC is the cooling temperature you wish to maintain when the Flt C or Flt V inputs are active.
Range is 35c to "—" (off)

DI= -- De-Ice
The SMT-700 will monitor the fan coil temperature and stop the indoor fan when the fan coil temperature falls below 27c.
However, if required this value can be adjusted from the default value by setting the DI-XX value to your preferred temperature.

EC= OF Economy Function
Economy function permits the introduction of outside air into a building if the outside air temperature is cool enough to assist with the cooling of the building.
EC= OF Economy function OFF
EC=On Economy function ON
(Note: Only If outside air sensor fitted (OA Sensor) **AND** Sw7=0ff (Zoning disabled)

Additional Capabilities

Fault / Occupancy inputs
NOTE: The fault logic of the SMT-700 is Fail Safe.
A green LED is fitted on the main PCB and labelled "System OK". If this LED is not lit, then a fault condition exists from either of the fault inputs or an internally detected SMT-700 fault. When a fault is detected the fault relay will DE-ENERGISE and the Green "System OK" LED will turn off.

The SMT-700 Main PCB is fitted with two equipment fault inputs. These inputs are marked "FltV" and "FltC".
If either or both of these fault inputs are tripped, the following default[1] events will occur
- All heating & cooling outputs will be set to OFF
- The indoor fan is set to low speed. (To maintain ventilation)
- The onboard FAULT relay will turn OFF.
- The green "SYSTEM OK" LED on the main PCB will turn OFF.
- The word "Fault" on the wall controller LCD will be visible.

The fault inputs can be used to automatically shut the air conditioning system down in the following circumstances.
- The Air Conditioning HP/LP limit has been reached (By monitoring the HP/LP switch status).
- The water flow for a water sourced heat pump has failed (By monitoring a flow / pressure switch).
- The condensate tray is full (if fitted with a liquid level switch).
- A phase for the compressor has failed (if a phase fail relay is fitted).
- A fire input has been tripped or other emergency shutdown event has occurred. (Note – for fire shut down you may need to program the fan speed to off also by setting FF to 0).
- Other examples for the use of the fault inputs include - Duct pressure switches, remote time clock override shutdowns, DDC shutdown signals etc.

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[1] These values can be installer set to operate differently as described in the "Occupancy Mode" section of this manual.

The inputs logic is described below.

Fault Input V (Voltage) 24VAC.	Used when the fault output of the equipment under the SMT-700 control supplies (or looses) a 24VAC fault signal when it is in a in fault condition.
Fault Input C (Contact)	Fault input "C" is used when the equipment under the SMT-700 control closes (or opens) a voltage free, dry contact when in the fault condition.
SW1, "Fault Logic Select " on the main PCB selects the logic of the fault input, either as a normal or fail safe fault input. See the wiring example on page 3 for this switch location	
Position "A"	If the switch is in position "A" the SMT-700 will be in fault when fault input "V" has 24VAC **applied** to it, or if fault input "C" contacts are **shorted**.
Position "B"	If the switch is in position "B" the SMT-700 will be in fault when 24VAC has been **removed** from fault input "V" or when an **open circuit** is detected at fault input "C".

Occupancy inputs & Outputs

As discussed briefly above, the SMT-700 fault input function can be redefined by changing three separate values in the advanced installer menu. This menu is described on page 11 of the manual.

When the fault input(s) are active, the FF (Fault fan speed is selected), FH (fault heating set point is used) and FC (fault cooling set point is used).

The Occupancy / fault inputs than can then be connected to a door key switch, movement sensor, DDC building management system, alarm system (for automatic un-occupied mode when alarm is armed) or to a remote override switch that when tripped, will substitute the room occupants temperature settings for the FF, FH & FC Advanced installer menu values. When this input is returned to the normal state, so will the user set temperature values as set at the wall controller.

Status Output.

A normally open 1A @240V relay has been provided as a Status output. This relay will energise when ever the SMT-700 is calling a function from the air conditioning system.

This relay's primary function is to provide feedback to other equipment that the heating or cooling system is in use. This can be used as a "heart beat" indicator that will trip a remote alarm if the heating or cooling system has not been used for a pre-set period of time. Alternatively, this can be connected to an energy consumption data logger for billing purposes.

LCD Mode indicators / Diagnostics.

Compressor protection delay.
> If the word "Heat" or "Cool" flashes in the LCD, a 4 minute anti cycle delay is in progress. Heating or cooling calls will not be initiated during this safety lockout period.

Heating or Cooling running.
> The word "Heat" or "Cool" will change to "Heating" or "Cooling" when the air conditioning system is heating or cooling.

Stage Indication.
> A small "full stop" will appear on the end of the word "MODE" when stage 2 heating or cooling is being called. This full stop will flash when Auxiliary heating is called / required.

Spanner Icon
> The appearance of the spanner ICON in the LCD indicates an internal SMT-700 fault has occurred. Typically loss of communication between the wall controller and the main PCB.

FAULT
> If the word "Fault" is shown in the LCD, an external device connected to the fault input on the main PCB has been activated.
> **Note:** The word "FAULT" is NOT shown if the FF, FH or FC values have been set from the factory default values.

Padlock ICON
> The padlock symbol will be shown when ever the keyboard is locked. If a locked button has been pressed or a user control limit has been reached the padlock symbol will flash to remind the user the attempted operation is prohibited.

Main PCB Indicators & Functions.

Reversing valve logic

To minimise reversing valve operations the SMT-700 will keep the reversing valve in its last mode when the compressors stop. For example, when the heating set point is reached the reversing valve will stay energised when the compressor stops ready for the next heating call. The reversing valve will only change mode in this example until just before cooling is required where it will stay de-energised when the compressor stops.
Turning the SMT-700 OFF at the wall controller will de-energise the reversing valve after a 3 minute delay.

LED indicators

All relays on the SMT-700 are identified by printing on the PCB. The relay coil has a LED in parallel so that when a relay coil is energised, the associated LED will be on. This simplifies diagnostics greatly.

System OK indication

The green system OK indicator will be lit when ever the SMT-700 is operating normally.

Power ON indicator

The RED power on indictor proves the presence of power and fuse condition of the SMT-700 main PCB.

Zone safety relay

With SW7 set to off (Zone select) the SMT-700 will keep one zone relay on at all times to protect against an installer forgetting to turn SW7 to on after wiring zone dampers to the A/C system.

Sensor Configurations Examples

The "TT" "OA" or "Z2" inputs are able to accept multiple temperature sensor inputs rather than just a single sensor if it is necessary to average the temperature over a larger area than one temperature sensor can accommodate. Typical sensor configuration as are detailed below.

Note: Single element (Smart Temp P/n H-RS-01) and twin element (Smart Temp P/n H-RS-02) sensors may be required. 3 sensor option not recommended as the twin element sensor has the same "Voting Right" for averaging as the two single element sensors in the same circuit.
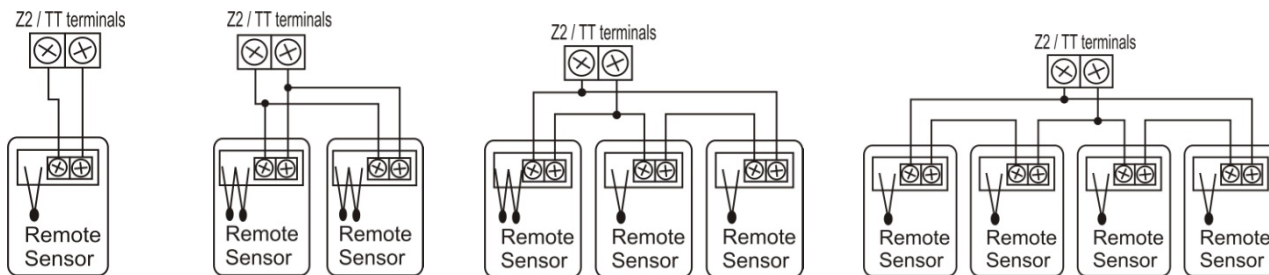
1 x P/n H-RS-01   2 x P/n H-RS-02   1 x P/n H-RS-02 &   4 x P/n H-RS-01
                                                   2 x P/n H-RS-01

Testing & Setup

The SMT-700 should be regarded as a standard thermostat for setup and testing. A simple common sense attitude should be applied to the testing of the system

To test the Heating simply raise the heating set point temperature above the room (or zone temperature) and ensuring the Air conditioning starts in heat mode and runs satisfactorily, verify that warm air is being produced and directed to the appropriate zone as shown on the SMT-700 wall display. Verify the correct LEDS (as determined by the mode setup) are illuminated on in the main PCB. This may or may not include testing the three indoor fan speeds in heating mode (if applicable). Testing the cooling is equally simple, lower the cooling set point temperature to below the current room temperature and insure the Air conditioning starts in cool mode and runs satisfactorily and chilled air is produced. This may or may not include testing the three indoor fan speeds in cooling mode.

Tip:- The SMT-700 LCD will change the word Heat (or Cool) to Heating (or Cooling) when heating or cooling is taking place. The full stop ". " on the end of the word "MODE" will become visible when the SMT-700 is demanding 2nd stage heating or cooling , and flash when the 3rd stage of heating is being used.

Please note the Economy function overrides the normal zoning function. If Economy mode has been set this testing procedure may not work as the SMT-700 may determine outside air is better suited for cooling purpose than running the cooling system. If Economy mode is active, the word "Economy" will be visible on the LCD if outside air is being used to cool.

Once the correct operation of the Heating & cooling system has been verified testing of the zoning (if installed) must be completed. The simplest way to accomplish this is to turn the SMT-700 to Fan only mode and tap the on/off button to select zone 1 only. Air should only be coming from the zone 1 registers (vents) and the Z1 LED on the main PCB should be on (Z2 LED should be OFF). Select Zone 2 only by tapping the On/Off button and verify that air is only coming from the zone 2 registers (vents) and the Z2 LED on the main PCB should be on (Z1 LED should be OFF).

Test other functions that may be active on this installation of the SMT-700 such as outdoor air temperature sensors, timer functions and keyboard locks etc to ensure the system as installed performs to the expected level. If the SMT-700 is NOT performing to the desired expectation please study that function again in this manual. If, you have questions or concerns, please contact Smart Temp or an authorised agent for technical support.

Fan Coil sensor & Functions
The SMT-700 fan coil sensor is responsible for warm start; residual heat / cool fan run functions etc.

If Heating,
> The indoor fan will delay starting until after the indoor coil temperature exceeds 33c.
> The indoor fan will stop if the indoor coil temperature falls below 27c.

In Cooling.
> The Indoor fan & compressors will stop for 10 mins if the indoor coil temperature drops below – 2c.
> The indoor fan will run on momentarily when cooling stops to purge.

SMT-700 sensor resistance table – all sensors

TZT0-701 Sensor resistance table. 10K NTC type II																														
Deg C	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
KΩ	32.96	31.31	29.76	28.29	26.9	25.58	24.34	23.16	22.05	20.99	20	19.05	18.16	17.32	16.286	15.34	14.395	14.36	13.76	13.09	12.51	11.96	11.43	10.93	10.45	10.0	9.57	9.16	8.75	8.4	8.05

Commissioning hint.
If commissioning a large apartment project, by keeping a wall controller with you and swapping it for the room wall controller fitted to the apartment you can easily activate heating / cooling and zone functions etc while you are at the main PCB to verify correct equipment operation. Simply swap the wiring back to the apartment controller at the completion of the commissioning process. This eliminates the need for two people when commissioning or endless trips up and down ladders to change functions or fan speeds with the apartment fitted controller.

Troubleshooting

Fault Table		
Symptom	**Suspected Fault**	**Suggested remedy**
Power LED on main PCB is OFF	Loss of power to main PCB	Check supply voltage
	PCB Fuse failed.	Check PCB fuses
	240V / 24V switch in wrong position	Check voltage selection switch
	Faulty Power LED	Check to see if any other PCB LEDS are on.
"System OK" LED OFF & "Fault" is displayed on LCD when no fault exists.	Device connected to fault input has initiated a shut down.	Correct fault from external device.
	Fault logic jumper (A/B switch) in the wrong position.	Change fault logic switch position
	Short on Flt "A" fault input cabling.	Check fault input wiring
Spanner icon on in LCD No equipment function	Internal SMT-700 Fault detected. Communication loss between main PCB and wall controller should be strongly suspected.	Make sure you use screened cable. Check wiring between wall controller and main PCB for shorts or open circuits. Ensure correct wiring. Cycle power to reset.
Fan, Cool or Heat does not work when PCB LED's show these relays on	Separate supplies are required for the fan, cooling and heating relays.	Ensure supply voltage has been applied to Gin, Yin and Win terminals.
Cannot select either heat or cool modes	SMT-700 set for Heating or cooling only modes	See Advanced user menu on page 8 for information on this function
PIN 21 does not let me into installer mode	PIN has been set to another value other than the default 21.	Contact installer for the current PIN. Return wall controller to Smart Temp or approved service agent for resetting. (Service Fee may apply)
Fan sometimes stops and starts intermittently while heating or cooling is running	This may not be a fault.	Check fan coil sensor temperature as fan coil may not be at correct temperature for fan operation.
	Check Function switch 1, 2 & 4 for correct position	SMT-700 may not be in correct operational mode.
Main PCB power LED is on but wall controller has no display	Faulty control wiring.	Check wiring between wall controller and main PCB. Should measure 12V DC between terminals 1 & 2 (approximately)
No Heating or cooling or fan etc outputs from the relays	Function not called by SMT-700.	Check the LED on main PCB for the relay to ensure the SMT-700 is calling the function in question.
	No power to relay common	Ensure Gin, Yin & Win has power applied to them. See page 3 for wiring information.
Air Conditioning System seems to runs continuously.	Heating and or cooling temperatures set at unrealistic values.	Set a lower heat temperature and/or a higher cooling temperature.
	Check sw2 for correct settings.	Heat Cool system set to Heat Pump mode.
	Fan set to Fan ON mode	Change fan mode to Auto
Erratic Damper operation – constantly moving despite no change in SMT-700 damper output.	Some brands of dampers "feedback" voltage on the non-used terminals. i.e. while driving open voltage can be found from the damper on the drive closed terminal. This function prevents dampers being wired in parallel.	Replace the damper with a brand that does not have this feedback problem, such as Belimo LM24T available from Smart Temp or authorised Smart Temp Distributor.
Some buttons do not appear to operate	Key board lock is on	Enter installer mode and unlock buttons. Requires correct pin. See page 8
Cooling called by wall controller but Y1 & Y2 relays Off	Indoor coil iced up	Compressors & Fan stoped for 10 minutes to de-ice indoor coil.
	LCD shows "Economy" – This is Not a fault.	Outside air economy function cooling being used rather than compressors. See page 7.
Temperature reading seems inaccurate	Check sensor location	Move sensors away from drafts or external heat sources
	Check wall penetrations. Warm or cool outside air may travel down wall cavity and through cable penetration and effect sensor.	Block all holes behind the sensors or wall controller.
	Incorrect calibration factor applied to sensor.	See page 8 for details on setting sensor offsets.

Smart Temp

Elegance

SMT-700 User manual

Ver 3.0. 0807

Congratulations on the purchase of your new Thermostat!

Your new air conditioning system thermostat has been built using the best components and design philosophy currently available. As a result, if properly installed your Smart Temp SMT-700 thermostat will provide you with many years of trouble free comfort.

The wall thermostat has been designed by Smart Temp Australia P/L to be an attractive, highly reliable and an easy to use thermostat. By taking the time to read and understand these simple instructions you can take advantage of many of the capabilities that are offered in this high quality product.

Important – READ THIS FIRST

The SMT-700 thermostat has been designed to be a very flexible & powerful Air Conditioning controller. It has many industry leading and innovative functions and capabilities.

This manual provides information on all capabilities offered by this thermostat, even those function that have not been required on your installation. Therefore, please use the index provided and read the sections of this manual only relevant to your installation and disregard functions or features that not applicable.

Contents

Introduction

Your air conditioning system has been fitted with an advanced and energy efficient thermostat controller. The Smart Temp thermostat model SMT-700 is able to manage your comfort levels in a number of ways. Your installer will have programmed your SMT-700 thermostat to specifically fit your needs, the requirements of the building and the air conditioning equipment connected to it.

If after reviewing this manual there are features or functions that you would consider desirable and that are not active on your thermostat, please contact your installer or another authorised Smart Temp service agent for advice on adding these functions.

To assist with the clarity of the manual, it has been divided into the following 5 main sections.

- Residential Programmable Mode.
  This section of the manual explains how to use the SMT-700 when installed in a home or apartment. It contains information on how to program the thermostat, use zone control (if installed) and get the most from your air conditioning system

- Commercial Programmable Mode.
  When using the SMT-700 thermostat in a commercial building special functions are available. Capabilities such as after-hours run timers, outside air economy control and other commercial air conditioning management capabilities are detailed in this part of the user manual.

- Manual Mode (can be used in either residential or commercial buildings).
  Often programming or fully automatic air conditioning control is not required. In these circumstances the installer will have set the SMT-700 thermostat for manual mode. This mode is the easiest mode to use the air conditioning system in, but it will not automatically turn you're A/C system off (or down) at the end of the day.

- Common Functions.
  This part of the user manual explains all the functions and capability that will be available to you regardless of what mode the thermostat has been put into by the installer

- Advanced functions.
  Your air conditioning system has some very advanced control and energy management capabilities. This part of the manual will explain these capabilities so you are able to better understand why your air conditioning system and SMT-700 thermostat is behaving the way it is.

- Glossary.
  This section of this manual will provide you with additional details on the function of buttons, operational modes and LCD indicators etc.

Residential Programmable Mode
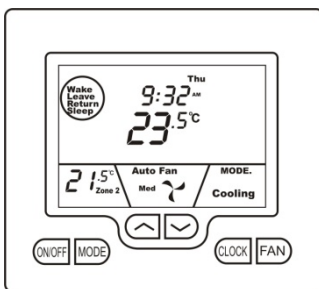
Your residential programmable thermostat is able to be programmed by you, to automatically control the desired home heating and cooling temperatures.

4 times per day, 7 days per week a separate heating and/or cooling temperature can be programmed into the thermostat. When the programmed time arrives your thermostat will automatically use the programmed desired heating and cooling temperature for that time to automatically control your home air conditioning system. These programmed temperatures will remain active until the next pre-programmed event arrives later that day (or first event next day) or until you override these temperatures manually.

The Buttons Explained

On/Off – (Zone Select if function installed)
Quickly press the On/Off button to turn the SMT-700 thermostat On. To turn the SMT-700 thermostat OFF, **press & hold** this button for 2 seconds until the word "OFF" is displayed in the LCD. If the Zoning function is enabled (see Zone Control on page 14), tap the On/Off button to cycle between Zone 1 only, Zone 2 only then both zones.

Mode
Tap this button to cycle the SMT-700 thermostat through the available modes, Heat only, Cool only, Fan Only (ventilation mode) or Auto season change over mode. See page 12 for more information on Modes.

Up (▲)
Use this button to increase the desired room temperature for the heating or cooling modes, or increase a "value" in programming modes. Also used to force override the pre-programmed temperatures and temporarily replace them with a new higher temperature.

Down (▼)
Use this button to decrease the desired room temperature for heating or cooling modes, or decrease a "value" in programming modes. Also used to force override the pre-programmed temperatures and temporarily replace them with a new lower temperature.

Clock
Tap the clock button to begin setting the clock. Press and hold the clock button for 2 seconds to begin programming your daily events.

Fan
Single Speed Fan -. Tap this button to cycle between Continuous fan (Fan ON) and Auto Fan.
Three Speed Fan – Tap this button to cycle between Low, Medium, High & Auto Fan speeds.
Press and hold this button for 5 seconds to toggle between Continuous fan (Fan ON) and Auto Fan.

Setting The Clock

Your SMT-700 thermostat is fitted with a real time clock. This clock is used by the SMT-700 thermostat for the programming functions described below. It is <u>essential</u> that the clock time and day are set accurately if you require your programmed events to start on time.

To set the clock, tap the clock button. The LCD will show the Hours Digit flashing. Use the up (▲) or down (▼) button to adjust the hours to the correct time (note the AM / PM symbol) Tap the clock button again and now the minute's digits will flash. Adjust this value using the up (▲) or down (▼) button to show the correct minute. Tap the Clock button again and now the week day flashes, again use the up (▲) or down (▼) button to set this value to the correct day of the week. Tap the clock button again to exit the clock set function. Your clock is now set.

Programming Your 4 Daily Events

The SMT-700 is an individual 7-day programmable thermostat. For each day of the week you are able to have 4 time schedules or programmed events. For clarity these events are conveniently named "Wake", "Leave", "Return" & "Sleep".

The "Wake" event may be used to set the temperatures of your home that you would like to wake up to.
The "Leave" event is typically used to set the temperatures you wish your home to maintain whilst you are away at work.
The "Return" event is often used to set the temperature you wish to be greeted with upon returning home at the end of the day.
The "Sleep" event can be used to set a comfortable and energy efficient temperature while you sleep.

You are permitted to have every event occur at a different time of the day and set a different heating and cooling set temperature for each of the 4 events. You are able to set a heating set point temperature between Heating OFF and 38 degrees Celsius. You are able to set a cooling temperature between zero degrees Celsius and Cooling OFF provided the installer has not set control limits.

<u>Remember</u>, each of the 4 event programmed set temperatures will hold the home temperature until the next scheduled event time arrives where it's set temperature will be used. So:-

> The "Wake" set temperature will be the temperature of your home until the "Leave" time arrives, then
> The "Leave" set temperature will be the temperature of your home until the "Return" time arrives, then
> The "Return" set temperature will be the temperature of your home until the "Sleep" time arrives, then
> The "Sleep" set temperature will be the temperature of your home until the next days "Start" time arrives.

Programming your SMT-700 thermostat or setting these daily events is no more complicated than setting the clock as described previously. The same buttons are used in the same sequence, using the Clock button to advance to the next step, and the up (▲) or down (▼) buttons to make changes. The LCD shows only relevant information for the event being adjusted thus reducing possible errors that may be caused by having confusing information displayed on the LCD.

To enter the program mode, press and hold the Clock button for 5 seconds. The display will change to show the Day "Monday" flashing. Using the up (▲) or down (▼) buttons adjust the day to the day you wish to start programming an event or to the day you wish to edit an existing event.

Tap the clock button to advance to the next step, The LCD will show the word "Wake" with the hour's digit flashes. Using the up (▲) or down (▼) buttons adjust the hours to the time you wish the "Wake" event to commence for the currently selected day.

Tap the Clock button again, now the minute's digits flashes. Using the up (▲) or down (▼) buttons set the minute to the time you wish the "Wake" event to commence.

Tap the Clock button again. If the SMT-700 thermostat has been set by the installer to control the optional climate zoning AND if the option to program the zones has been set by the installer, you will now have the ability to set which zones you require to be ON during the wake event. Using the up (▲) or down (▼) buttons set the zones you wish to be ON for the "Wake" event.

If the installer has set to the Program Zone option to "OFF" this step is skipped by the SMT-700 thermostat during the programming sequence.

Tap the Clock button again, now the word "Heat" (if heating mode is enabled by the installer) and a temperature value is shown in the LCD, using the up (▲) or down (▼) buttons set the desired Heating temperature for the "Wake" event. Tap the Clock button again, now the word "Cool" (if cooling mode is enabled by the installer) and a temperature value is shown in the LCD, using the up (▲) or down (▼) buttons set the desired Cooling temperature for the Wake event.

NOTE: there must be a minimum of 1 deg C difference between heating and cooling set points. The heating temperature must be at least 1 deg C lower than the cooling set temperature. If you set the heating or cooling set point closer than this minimum value, the SMT-700 thermostat will automatically "push" the other set point away to maintain this minimum value.

Tap the Clock button again and the Day previously selected will be shown along with the word "Leave". The Hour digit will flash indicating that this value can now be adjusted with the up (▲) or down (▼) buttons. Set the hour to the time you wish the "Leave" event to commence.

Continue to tap the Clock button to advance you through the "Leave" "Minute", then "Leave" Zone (if enabled) "Leave" Heating (if enabled) and "Leave" cooling (if enabled) temperatures. Again by continuing to tap the Clock button you will advance to through the "Return" program and then "Sleep" programs for the day you have chosen to program.

Taping the Clock button again the LCD will now show the word "COPY".

You now have TWO options

Option 1 - Continue programming as above.
Simply continue to tap the Clock Button as you have been to advance to the next day, "Tuesday" in this example "Wake", "Leave", "Return", "Sleep" then Wednesday, Thursday etc, following the same simple steps previously explained…. OR

Option 2 - Copy Program – To copy the values you have just set to other days of the week.
Rather than taping the Clock button now, tap the up (▲) or down (▼) buttons to "TAG" each additional day you wish to copy the currently set days program to. When you have finished "Tagging" the days you desire press the Clock button to initiate the copy process. The word "Copy" will flash briefly to confirm the copy process and your current days values will be copied to the days selected. Normal programming will resume at the next day to be programmed.

Programming the Zones (If Enabled)

As briefly touched upon in the above description, your SMT-700 thermostat has the useful feature of being able to automatically change the Active Zones at pre set times (if enabled by the installer). For example, this feature permits the SMT-700 thermostat to automatically switch the bedroom zone ON when the "Sleep" event starts, or to automatically switch the unoccupied upstairs zone OFF during the day. This has the benefit of reducing energy costs while still maintaining a comfortable living environment in the occupied areas of your home. Naturally, these settings can be overridden at any time by tapping the on/off button to manually select active zones as described on page 14 of this manual.

Temporary Temperature Override

To make your SMT-700 thermostat even more capable and flexible, it has been provided with a temporary program override function. This permits you to temporarily change your event temperatures, just for today and only until the next programmed event starts. For example, you may have guests visiting that would like it a little warmer or cooler than you would normally have the thermostat set, or you may find yourself at home when normally you would be away from your home, possibly a sick day for example.

Simply press and hold the up (▲) or down (▼) buttons for 3 seconds. The SMT-700 thermostat display will change to show the word "SET", and the active set point for the current mode. (Heating, Cooling or Auto modes) as you hold the up (▲) or down (▼) buttons the current set point will change.

If Auto mode is selected, after adjusting the Heat set point wait without touching a button for 3 seconds for the SMT-700 thermostat display to change to show "Cool" and "SET" and your current set cooling temperature. If desired change this value with the up (▲) or down (▼) buttons. Again wait for 3 seconds to exit the temporary overridden programmed mode. The LCD will now show "Override" and your new temporary setting will be in use until the next programmed event change occurs.

Should you need to cancel a temporary override, simply press and hold both the up (▲) **AND** (▼) buttons for a few seconds. The word "Override" will disappear from the LCD and your pre-programmed settings will be restored.

Default Program

	Wake			Leave			Return			Sleep		
Monday	7:00am	Heating	18	8:30am	Heating	10	5:00pm	Heating	20	10:00pm	Heating	12
		Cooling	25		Cooling	30		Cooling	25		Cooling	30
Tuesday	7:00am	Heating	18	8:30am	Heating	10	5:00pm	Heating	20	10:00pm	Heating	12
		Cooling	25		Cooling	30		Cooling	25		Cooling	30
Wednesday	7:00am	Heating	18	8:30am	Heating	10	5:00pm	Heating	20	10:00pm	Heating	12
		Cooling	25		Cooling	30		Cooling	25		Cooling	30
Thursday	7:00am	Heating	18	8:30am	Heating	10	5:00pm	Heating	20	10:00pm	Heating	12
		Cooling	25		Cooling	30		Cooling	25		Cooling	30
Friday	7:00am	Heating	18	8:30am	Heating	10	5:00pm	Heating	20	10:00pm	Heating	12
		Cooling	25		Cooling	30		Cooling	25		Cooling	30
Saturday	8:00am	Heating	18	8:30am	Heating	18	5:00pm	Heating	20	10:00pm	Heating	12
		Cooling	25		Cooling	30		Cooling	25		Cooling	30
Sunday	8:00am	Heating	18	8:30am	Heating	18	5:00pm	Heating	20	10:00pm	Heating	12
		Cooling	25		Cooling	30		Cooling	25		Cooling	30

Commercial Programmable Mode
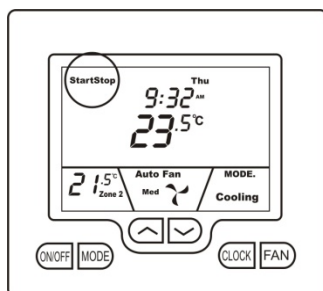
Your commercial programmable thermostat is able to be programmed by you, to automatically control the desired office heating and cooling temperatures.

2 times per day, 7 days per week a separate heating and/or cooling temperature can be programmed by you into the thermostat. When the programmed time arrives your thermostat will automatically use the programmed desired heating and cooling temperature to automatically control your office air conditioning system. These programmed temperatures will remain active until the next pre-programmed time arrives or until you override these temperatures manually or until you activate the 2 hour after hour run timer.

The Buttons Explained

On/Off – After hours Override (or Zone Select if function is installed)
Quickly press the On/Off button to turn the SMT-700 thermostat On where it will run your temperature control program. To turn the SMT-700 thermostat OFF, **press & hold** this button for 2 seconds until the word "OFF" is displayed in the LCD.
If zoning is enabled - Tap the On/Off button to cycle between Zone 1 only, Zone 2 only then both zones.
If zoning is disabled - Tap this button to toggle the 2 hours after hours run timer on or off.

Mode
Tap this button to cycle the SMT-700 thermostat through the available modes, Heat only, Cool only, Fan Only (ventilation mode) or Auto season change over mode. See page 12 of this manual for more information on Modes.

Up (▲)
Use this button to increase the desired room temperature for the heating or cooling modes, or increase a "value" in programming modes. Also used to force override the pre-programmed temperatures and temporarily replace them with a new higher set temperature.

Down (▼)
Use this button to decrease the desired room temperature for heating or cooling modes, or decrease a "value" in programming modes. Also used to force override the pre-programmed temperatures and temporarily replace them with a new lower set temperature.

Clock
Tap the clock button to begin setting the clock. Press and hold the clock button for 2 seconds to begin programming your daily events.

Fan
Single Speed Fan -. Tap this button to cycle between Continuous Fan (Fan ON) and Auto Fan.
Three Speed Fan – Tap this button to cycle between Low, Medium, High & Auto Fan speeds.
Press and hold this button for 5 seconds to toggle between Continuous Fan (Fan ON) and Auto Fan.

Setting The Clock

Your SMT-700 thermostat is fitted with a real time clock. This clock is used by the SMT-700 thermostat for the programming functions described below. It is <u>essential</u> that the clock time and day are set accurately if you require your programmed events to start on time.

To set the clock, tap the clock button. The LCD will show the Hours Digit flashing. Use the up (▲) or down (▼) button to adjust the hours to the correct time (note the AM / PM symbol) Tap the clock button again and now the minute's digits will flash. Adjust this value using the up (▲) or down (▼) button to show the correct minute. Tap the Clock button again and now the week day flashes, again use up (▲) or down (▼) button to set this value to the correct day of the week. Tap the clock button again to exit the clock set function.

Programming Your 2 Daily Events

The SMT-700 thermostat is an individual 7-day programmable thermostat. For each day of the week you are able to have 2 time schedules or programmed events occur. For clarity these events are conveniently named "Start" and "Stop".
The "Start" event is used to set the time you wish your office to start at the beginning of the day. You can program your desired heating and cooling temperatures that you wish your office to be when the start event begins.

The "Stop" event is used to set the temperatures you wish office to be at the end of the working day. You are able to program your heating and or cooling to "OFF" or simply set a more economical temperature than your start program to prevent your office over-heating or becoming to cool at during the night.

You are permitted to have the Start and Stop event occur at a different time of the day and set a different heating and cooling desired set temperature for each of the 2 events. You are able to set a heating set point temperature between Heating OFF and 38 degrees Celsius. You are able to set a cooling temperature between zero degrees Celsius and Cooling OFF.

Programming your SMT-700 thermostat or setting these daily events is no more complicated than setting the clock as described previously. The same buttons are used in the same sequence, using the Clock button to advance to the next step, and the up (▲) or down (▼) buttons to make changes. The LCD shows only relevant information for the event being adjusted thus reducing possible errors that may be caused by having confusing information displayed on the LCD.
This makes the programming of the SMT-700 thermostat a simple and logical process.

To enter the program mode, press and hold the Clock button for 5 seconds. The display will change and the Day "Monday" will flash. Using the up (▲) or down (▼) buttons adjust the day to the day you wish to start programming or to the day you wish to edit an existing program.

Tap the clock button to advance to the next step, The LCD will show the word "Start" with the hour's digit flashing. Using the up (▲) or down (▼) buttons to adjust the hours to the time you wish the "Start" event to commence for the day selected.

Tap the Clock button again, now the minute's digits flashes. Using the up (▲) or down (▼) buttons set the minute to the time you wish the "Start" event to commence.

Tap the Clock button again. If the SMT-700 thermostat has been set by the installer to control the optional climate zoning AND if the option to program the zones has been set by the installer, you will now have the ability to set which zones you require to be ON during the "Start" event. Using the up (▲) or down (▼) buttons set the zones you wish to be ON for the "Start" event.

If the installer has set to the Program Zone option "OFF" this step is skipped by the SMT-700 thermostat during the programming sequence.

Tap the Clock button again, now the word "Heat" (if heating mode is enabled by the installer) and a temperature value is shown in the LCD, using the up (▲) or down (▼) buttons set the desired Heating temperature for the "Start" event. Tap the Clock button again, now the word "Cool" (if cooling mode is enabled by the installer) and a temperature value is shown in the LCD, using the up (▲) or down (▼) buttons set the desired Cooling temperature for the "Start" event.

NOTE: there must be a minimum of 1 deg C difference between heating and cooling set points. The heating temperature must be at least 1 deg C lower than the cooling set temperature. If you set the heating or cooling set point closer than this minimum value, the SMT-700 thermostat will automatically "push" the other set point away to maintain this minimum value.

Tap the Clock button again and the day previously selected will be shown along with the word "Stop". The Hour digit will flash indicating that this value can now be adjusted with the up (▲) or down (▼) buttons. Set the hour to the time you wish the "STOP" event to commence.

Continue to tap the Clock button to advance you through the "Stop" "Minute", then "Stop" Zone (if enabled) "Stop" Heating (if enabled) and "Stop" cooling (if enabled) temperatures.

Taping the Clock button again the LCD will show the word "COPY".

You now have TWO options

Option 1 - Continue Programming as above.
Simply continue to tap the Clock Button as you have been to advance to the next day, "Tuesday" in this example "Start" & "Stop", then Wednesday, Thursday etc, following the same simple steps previously explained…. OR

Option 2 - Copy Program – To copy the values you have just set to other days of the week.
Rather than taping the Clock button now, tap the up (▲) or down (▼) buttons to "TAG" each additional day you wish to copy the currently set days program to. When you have finished "Tagging" the days you desire then press the Clock button to initiate the copy process. The word "Copy" will flash briefly to confirm the copy process and your current days values will be copied to the days selected. Normal programming will resume at the next day to be programmed.

☛ **Tip.**
On days when the office will be unoccupied, it is a wise idea to set the "START" and "STOP" programs to occur at the same time of day, say 8:00am for example. This way if "FAN ON" mode has been selected the fan will not start on those days where the office is un-occupied.

After Hours Run Timer

Note - if zoning has been used in your office, the after hours run timer function is automatically disabled.

An extremely useful feature of your SMT-700 thermostat is it's integrated after hours run timer function. This timer is useful when you find yourself working outside of the normal office hours. Tapping the On/Off button will initiate the after hours run timer function where the SMT-700 thermostat will then temporarily substitute that days "Stop" program temperatures with that days "Start" program temperatures but only for a timed two hour period. While this after hours run timer is operating the word "Timer" will flash on the LCD.

This function makes it extremely simple to return the office temperature to a comfortable working level without the fear of forgetting to turn the air conditioning system off at the end of your day.

☛ **Tip.**

To take advantage of the after hour timer function on days when the office is normally not open, program the "Start" program at 8:00am (for example) with your normal office occupied heating and cooling set temperatures and set the "Stop" program for the exact same time, 8:00 am in this example and the set temperatures to your normal "Stop" program values, Off for example. The SMT-700 will move straight to the "Stop" program and not run the air conditioning system but will have a valid "Start" temperature in memory ready for use by the afterhours run timer function.

For an office that is <u>NOT</u> open on a weekend an example of a Saturday and Sunday program is given below.

Day	Time	Suggested Heat set point	Suggested Cool set point
Saturday Start	8:00 am	Heat set = 22c	Cool Set = 25c
Saturday Stop	8:00 am	Heat Set = OFF	Cool Set = OFF
Sunday Start	8:00 am	Heat set = 22c	Cool Set = 25c
Sunday Stop	8:00 am	Heat Set = OFF	Cool Set = OFF

Temporary Temperature Override

To make your SMT-700 thermostat even more capable and flexible, it has been provided with a temporary program override function. This permits you to temporarily change your programmed event temperatures, just for today and only until the next programmed event starts.

Simply press and hold the up (▲) or down (▼) buttons for 3 seconds. The SMT-700 thermostat display will change to show the word "SET", and the active set point for the current mode. (heating, cooling or auto modes) as you hold the up (▲) or down (▼) buttons the current set point will change.

If Auto mode is selected, after adjusting the Heat set point wait without touching a button for 3 seconds for the SMT-700 thermostat display to change to show "Cool" and "SET" and your current set cooling temperature. If desired change this value with the up (▲) or down (▼) buttons. Again wait for 3 seconds to exit the temporary overridden programmed mode. The LCD will now show "Override" and your new temporary setting will be in use until the next programmed event change occurs.

Should you need to cancel a temporary override, simply press and hold the up (▲) **AND** (▼) buttons for a few seconds. The word "Override" will disappear from the LCD and your pre-programmed settings will be restored.

Programming the Zones (if enabled)

Note - if zoning has been used in your office, the afterhours run timer function is disabled.

As briefly touched upon in the above description, your SMT-700 thermostat has the useful feature of being able to automatically change the Active Zones at pre set times (if enabled by the installer). For example, this feature permits the SMT-700 thermostat to automatically switch to the second zone ON when the Start event starts, or to automatically switch the unoccupied boardroom zone OFF during the day. This has the benefit of reducing energy costs while still maintaining a comfortable environment in the occupied areas of your office. Naturally, these settings can be overridden at any time by tapping the on/off button to manually select active zones as described on page 14 of this manual.

<u>Manual Mode</u>
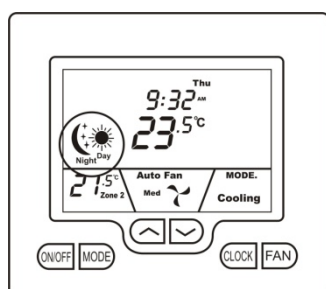
Quite often automatic time clock control of your air conditioning system is not required. In these instances your installer will have set your SMT-700 thermostat to manual mode.

Manual mode provides the easiest form of climate control for your home or office. Simply turn the SMT-700 thermostat on or off as required and set your desired temperatures. These set temperatures will then remain active until you decide to set a new value.

The Buttons Explained

On/Off (or Zone Select if function is installed)
Quickly press the On/Off button to turn the SMT-700 thermostat On. To turn the SMT-700 thermostat OFF, **press & hold** this button for 2 seconds until the word "OFF" is displayed in the LCD. Tap the On/Off button to cycle between Zone 1 only, Zone 2 only then both zones if zoning is enabled.

Mode
Tap this button to cycle the SMT-700 thermostat through the available modes, Heat only, Cool only, Fan Only (ventilation mode) or Auto season change over mode. See page 12 of this manual for more information on Modes.

Up (▲)
Use this button to increase the desired room temperature for the heating or cooling modes, or increase a "value" in programming modes. Also used to force override the pre-programmed temperatures and temporarily replace them with a new higher set temperature.

Down (▼)
Use this button to decrease the desired room temperature for heating or cooling modes, or decrease a "value" in programming modes. Also used to force override the pre-programmed temperatures and temporarily replace them with a new lower set temperature.

Clock
Tap the clock button to select day or night mode (if enabled). Press and hold the clock button for 2 seconds to set your SMT-700 clock.

Fan
Single Speed Fan -. Tap this button to cycle between Continuous fan (Fan ON) and Auto Fan.
Three Speed Fan – Tap this button to cycle between Low, Medium, High & Auto Fan speeds.
Press and hold this button for 5 seconds to toggle between Continuous fan (Fan ON) and Auto Fan.

Setting The Clock – Manual Mode

Your SMT-700 thermostat is fitted with a real time clock. This clock is simply provided to display the current day and time. It has NO functional control for the thermostat at all. To set the clock, Press & Hold the clock button for 5 seconds. The LCD will show the Hours Digit flashing. Use the up (▲) or down (▼) button to adjust the hours to the correct time (note the AM / PM symbol) Tap the clock button and now the minutes digits will flash. Adjust this value using the up (▲) or down (▼) button to show the correct minute. Tap the Clock button again and now the weekday flashes, again use up (▲) or down (▼) button to set this value to the correct day of the week. Tap the clock button again to exit the clock set function.

Day / Night Set points (if Active)

The SMT-700 thermostat has either a single adjustable set temperature or a separate Day heating & cooling set temperature and Night heating & cooling set temperature. If active, switching between Day & Night Modes is easily achieved by taping the clock button. The Day heating and cooling set points are active when the "SUN" symbol is shown on the LCD. The Night heating and cooling set points are active when the "Stars & Moon" symbol is shown on the LCD

To adjust the heating and cooling set points first select the day or night mode (if active) by tapping the clock button. Press and hold the up (▲) or down (▼) buttons for a few seconds, the LCD will change and show the word "SET" and the current mode (heating, cooling or auto) set temperature, press the up (▲) or down (▼) to adjust this value to the desired set temperature. If Auto mode is selected once the heating set point is as desired wait a few seconds without touching a button and the thermostat display will change to show the word "SET" and your COOLING set point will be displayed. Again, using the up (▲) or down (▼) button adjust your cooling set point to your desired value. After a few seconds the thermostat display will return to normal and your new set temperatures will take effect.

Timer Mode

In some applications, the SMT-700 thermostat "Auto OFF" timer feature may have been activated by the installer. When this function has been activated the word(s) "TIMER" or "TIMER OFF" will appear in the LCD. When active, the SMT-700 thermostat will automatically turn off after an installed / owner set pre programmed duration of time.

This function is ideal for use in training or interview rooms for example, where the room is not often used and where you want to ensure the air conditioning system is not left running for extended periods when the room is unoccupied.

To provide warning of the pending shutting down of the A/C system, one hour before the A/C system is about to turn off, the words "TIMER" will flash in the LCD to provide you with ample warning. Once the time period has expired the SMT-700 thermostat automatically turns the air conditioning system off.

If required pressing the On/Off button will reset the countdown timer and the heating or cooling will restart for the installer set period of time.

Should you wish you can turn the SMT-700 thermostat off at any time by pressing and holding the On/Off button for 2 seconds.

Common Functions

Selecting Heating, Cooling and Auto Modes.

Your SMT-700 thermostat is able to control the mode of your air conditioning system in a number of ways. Using the Mode button you are able to select your desired air condition mode. With each tap of the mode button the SMT-700 thermostat will cycle through Heating only mode, Cooling Only mode, Auto mode and Fan only (ventilation) modes.
These modes are described in more detail below.

Please Note: To suit your air conditioning system type, either the Heating or Cooling function may have been disabled.

Heat Only Mode - The SMT-700 thermostat will turn on the Heating when the room temperature falls below the Heat set point temperature by 0.5 deg Celsius. In Heat only mode the SMT-700 thermostat will NOT bring on the Cooling regardless of the room temperature and the Cooling Set point temperature. In Heat only mode, only the word "Heat" will be displayed in the LCD. When your air conditioning system is heating, the word "Heat" in the LCD will change to the word "Heating".
If the word "Heat" is flashing in the LCD the SMT-700 is performing a safety anti-cycle delay prior to restating the heating.

Cool Only Mode - The SMT-700 thermostat will turn on the Cooling when the room temperature rises above the Cool set point temperature by 0.5 deg Celsius. In Cool only mode the SMT-700 thermostat will NOT bring on the Heating regardless of the room temperature and Heating set point temperature. In Cool only mode, only the word "Cool" will be displayed in the LCD. When your air conditioning system is cooling, the word "Cool" in the LCD will change to the word "Cooling".
If the word "Cool" is flashing in the LCD the SMT-700 is performing a safety anti-cycle delay prior to restating the Cooling.

Auto-change Over Mode - The SMT-700 thermostat will turn on the Heating if the room temperature falls below the Heat Set point temperature and the Cooling if the room temperature rises above the Cool Set point temperature by 0.5 deg Celsius. This is the recommended mode as it provides automatic control of the air conditioning system to maintain the desired room temperature. Auto changeover mode is indicated by both the words "Heat" & "Cool" in the LCD.
If the word "Heat" or "Cool" is flashing in the LCD the SMT-700 is performing a safety anti-cycle delay prior to restating the air conditioning system.

Fan Only. If Fan only is selected the SMT-700 thermostat will turn on the system fan for continuous operation. The SMT-700 thermostat will not control the heating or cooling system regardless of the room temperature and the heating and cooling set point temperature(s). If Fan only is chosen the words "Heat" or "Cool" are NOT shown in the LCD. In Fan only mode the fan will operate 100% of the time. Fan only mode is typically used for ventilation purposes.

Fan Control Logic

Fan management of an air conditioning system is vitally important to achieve maximum comfort and energy efficient operation. The fan of your air conditioning system is able to operate in two main modes, each mode is described below.

Auto Fan Mode

If the user has selected Auto Fan mode with the "FAN" button the indoor fan will turn on when the heating or cooling turns on, and off again once the heating or cooling turns off. To prevent cool drafts occurring when the heating first starts, the fan may delay starting momentarily to permit your air conditioning to pre warm. To conserve energy your fan may continue to run monetarily after the heating or cooling has stopped to extract all the warm or cool air still remaining in the air condition system and bring that conditioned air into the building.

Fan On Mode

By selecting "Fan On" or continuous fan mode the SMT-700 thermostat indoor fan will operate continuously between the "Start" or "Wake" programs and the "Stop" or "Sleep" programs and then turn on and off as required with heating and cooling outside of those programmed events if your SMT-700 is set as a Programmable thermostat.

Please Note – Your installer may have activated some of the many advanced indoor fan management capabilities of the SMT-700 thermostat that work in partnership with the Fan On Mode. This may result in the fan operating differently than described above. If you find this to be the case and un-desirable, please contact your authorised Smart Temp service agent for advice on altering the function.
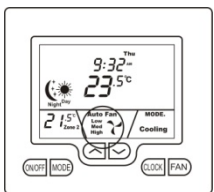
Fan Speeds

Single Fan Speed
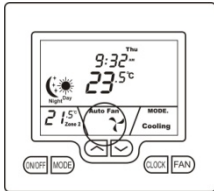
If your air conditioning system has one fan speed, your SMT-700 thermostat will display the fan information shown on the picture to the left. The words "High", "Med" or "Low" will be absent from the LCD.

Pressing the fan button with permit you to select either "Fan On mode" or "Auto Fan mode" as described above.

Three Fan Speed

If your air conditioning system is fitted with 3 fan speeds your SMT-700 thermostat will display the fan speeds as shown on the picture to the left.

Pressing the fan button will step the fan speed selection through "Low", then "Med(ium)", then "High" and finally Auto fan speed, (indicated by all three fan speeds being shown on the LCD). If auto fan speed has been selected the SMT-700 thermostat will indicate the automatically selected fan speed by flashing in appropriate word in the LCD.

Press and hold the Fan button for 3 seconds to toggle between Auto fan (where the fan turns on and off with heating and cooling) and Fan On, where the fan will run continuously most of the time (as set by the system installer).

If Auto Fan Speed has been selected, as indicated by all 3 fans speeds being shown on the LCD, your SMT-700 thermostat will automatically select the fan speed based on the difference between the room and set temperature.

Please Note: If zoning is enabled. To protect the Air Conditioning ducting and other components the installer may have selected the high fan speed to be locked out if only one zone is on.

Advanced Functions

Outdoor Air Temperature Display

The SMT-700 thermostat can be fitted with an optional outdoor air temperature sensor to display the current outdoor air temperature on the LCD. The outdoor air temperature is displayed in the lower left of the LCD along with the words "Outside Air Temperature". If zoning is also enabled and the zone 2 sensor has been installed, the LCD will alternate between the Outside Air Temperature and Zone 2 temperature every 5 seconds.

Outside Air Economy Function (If Fitted)

To further improve on the efficiency of your air conditioning system saving energy and money in running costs, your SMT-700 thermostat can use outside air for cooling if your air conditioning system has been designed and installed to take advantage of this advanced function. If cooling is required and the outside air is sufficiently cool enough your SMT-700 will draw in the cooler outside air into the building rather than use the warmer internal air. Again depending on the outside air temperature, your SMT-700 may or may not run the air conditioning system compressor.

If outside air is being used to assist in cooling, the word "Economy" will flash on the LCD.

Note, this function cannot be used in conjunction with the Zone Control Function.

Zone Control (if fitted)
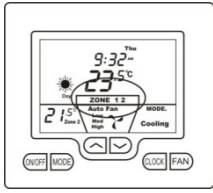
If zoning is enabled the word "Zone" and either "1", "2," or "1 2" (indicating both zones) will be shown. To select which zone(s) you wish to be controlled, simply tap the On/Off button to toggle between zone 1, Zone 2 or both zones

If the optional Zone 2 Temperature sensor has been installed the second zone temperature will also be shown in the LCD.

Some homes or offices require temperature control in two separate areas, a living and sleeping zone or upstairs and downstairs for example. If your SMT-700 thermostat shows the word "ZONE" then the Zoning function is active on your SMT-700 thermostat. You may also have information on the temperature in the second zone (if the optional second zone temperature sensor has been installed).

If you have the Zoning function active on your SMT-700 thermostat and the zone 2-temperature sensor is installed then your desired temperature will be exactly maintained in both zones of your home or office.

The SMT-700 thermostat will automatically open and close "dampers" (motorised valves that regulate the flow of air in the ducting that carry the warmed or cooled air from the Air Conditioning system to the various areas of the home or office) as well as controlling the Air Conditioning system to ensure the correct air temperature is directed to the appropriate area of the home or office.

This capability not only vastly improves the comfort in the home or office (especially in two story buildings or difficult to temperature regulate arrears), it dramatically reduces the energy costs by only operating Air Conditioning system in the arrears (or zones) that require it. This function eliminates the over heating or over cooling effects of some air-conditioning controllers.

Note, this function cannot be used in conjunction with the Outside Air Economy Function.

Changing Active Zones.

Simply tapping the On/Off button while the SMT-700 thermostat is switched on will cycle the SMT-700 thermostat between Zone 1 only operation, Zone 2 only operating then both Zones operating. When the zone is calling for warmed or cooled air it is directed to that particular zone in order to maintain that zone(s) desired temperature. If the optional zone 2 temperature sensor has been installed then the temperature is also measured in zone 2 (and controlled to the set point) as well as the zone 2 temperature being displayed on the LCD.

Please note.
The SMT-700 thermostat will maintain a minimum of one open zone at all times. To protect the air conditioning system and ducting you cannot turn both zones off at the same time.

Key Board Lock / Function Lock

Many of the features or functions of the SMT-700 can be locked by the owner or installer to prevent un-authorised tampering. When any locked function is attempted to be accessed, your SMT-700 will flash the padlock symbol to inform you that the function is locked or a control limit has been reached.

Fan Speed Management

As briefly touched upon previously in this manual, fan speed management is a critical component of effective air conditioning control. The fan is directly responsible for the air movement through your air conditioning system and home/office and has a significant impact on how efficiently your air conditioning system operates. If Auto Fan speed has been selected your SMT-700 will automatically select the most appropriate fan speed based on the difference between room and set temperature.

## Optimised Start

Optimised Start mode permits the SMT-700 thermostat to automatically calculate the most optimum time to start your air conditioning system so that your programmed set point temperature is reached <u>AT</u> the program start time.

Your A/C system will therefore turn on before the scheduled event so that the set temperature is achieved at the scheduled event time, not after it.

Glossary

The LCD Explained
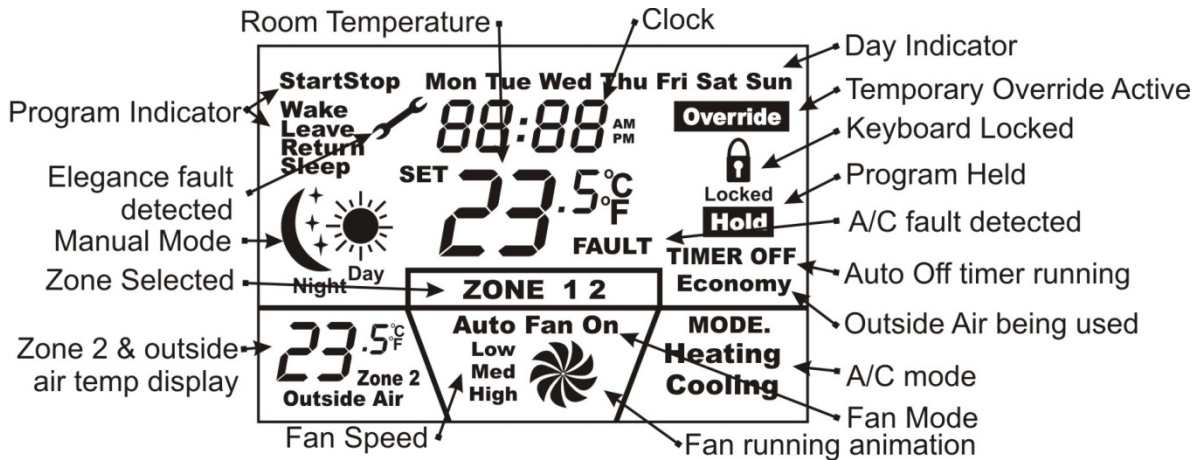
Program Event Indicator.
If "Wake", "Leave", "Return" or "Sleep" are shown, your SMT-700 thermostat is set as a programmable thermostat. This mode of operation is perfect for those that live a structured lifestyle. This is fully automatic mode where the residence occupier can pre program the home temperatures for 24 hours per day, 7 days per week. This is explained on page 4 of this manual.

2 Program Event Indicator.
Start / Stop or 2 event programming is typically used in commercial buildings where the Air conditioning is simply designed to turn on at a time (typically in the morning) maintain a single temperature all day then switch off at the end of the day (or maintain a more economical overnight temperature). The words highlighted on the LCD indicate this mode is set, and whether the Building A/C system is running. This function is described on page 7 of this manual.

Manual Mode Indicator.
The Sun or Moon symbol (or the lack of any programming information such as "Start"& "Stop", or "Wake" "Leave" "Return" & "Sleep") indicate the SMT-700 thermostat is in "Manual Mode". This mode is perfect for those who have a less structured lifestyle. Your SMT-700 thermostat may be set to provide two separate set points, offering a Day temperature and a separate Night temperature to be set, and easily swapped between the two as needed. Alternatively, a single heating and cooling set point may be provided. In this case the day & night symbols will not be shown. This function is described in more detail on page 10 of this manual.

Clock.
The clock displays the time. This time is used by the SMT-700 thermostat in program modes (2 or 4 events) to set the start/stop or program events. It is important that the clock is set correctly if the SMT-700 thermostat is used in a Programmable mode. The Clock is NOT used by the SMT-700 thermostat in manual mode – it simply displays the time. See programming on pages 5 & 8for details about setting the clock.

Day Indicator.
As with the clock described above, the SMT-700 thermostat relies on having the correct day set for its programming functions to be accurate. If using the programming functions the current day should be set correctly. See programming on pages 5 & 8 for details about setting the clock and day display.

Room / Set Temperature.
This portion of the LCD displays the current room temperature. (Note this temperature may or may not be measured at the location of the SMT-700 wall controller). In programming mode the current SET (or desired) room temperature is displayed in this location. The temperature is display in either degree Celsius or degrees Fahrenheit as set by the installer.

Outdoor / Zone Temperature.

This part of the display requires optional sensors to be installed to enable this function. Both the second control zone temperature and or outdoor temperature can be displayed.   Information on zoning can be found on page 14, information on the outdoor temperature display can be found on page 13 of this manual.

System Mode Indicator.

This part of the LCD provides information on the Air Conditioning System control mode. The SMT-700 thermostat is capable of controlling heating only, cooling only or both heating and cooling systems together.

If heating only mode is selected the word "Heat" is displayed. If cooling only mode is selected the word "Cool" is displayed. Auto season changeover mode is indicated by the words " Heat & Cool".

If the SMT-700 thermostat requests the air conditioning to supply warmed air, the word "Heating" will be displayed. If the SMT-700 thermostat requests the air conditioning to supply cooled air, the word "Cooling" will be displayed.

If the Word "Heat" or "Cool" is slowly blinking the SMT-700 thermostat is waiting for an installer set safety delay time to expire before activating the function. This delay period is to protect the A/C system under the SMT-700 thermostat control.

Fan Running Animation.

A small animation of a fan revolving will be displayed whenever the air conditioning system fan is running. Note" all separate parts of the fan animation are shown in the picture on page 15. When the SMT-700 thermostat is running normally only the necessary parts of the LCD necessary to provide the fan running animation will be displayed.

Fan Speed Indicator.

The SMT-700 thermostat can control up to three speeds of indoor fan if the installer has enabled this function. The manually selected fan speed is shown. Auto fan speed is shown by the three words "Low", "Med" & "High" in the LCD at one time. The automatically selected fan speed will flash.

Fan Mode Indicator.

The SMT-700 thermostat can turn the indoor fan On & Off in a number of ways depending on whether the SMT-700 thermostat is used in commercial or residential buildings, or whether the SMT-700 thermostat is heating or cooling. This is displayed as "AUTO FAN" or "FAN ON" mode. Page 12 details these functions.

Keyboard Lock Indicator.

When this symbol is shown parts of the keyboard are locked or the temperature control range is limited preventing changes to the thermostat settings. When a button is locked or a control range is limited the Padlock symbol will flash to warn you that the current function is prohibited. The SMT-700 thermostat has multiple levels of keyboard lock for both manual and programmable modes. See page 14 of the manual for more information on this function.

Active Zone Indicator.

To aid in increasing comfort levels while reducing running costs, the SMT-700 thermostat employs industry-leading features. One of these features is the ability to "Zone" or split your heating and or cooling system into 2 separate temperature controlled areas, each can have their own temperature sensor (Optional Zone 2 sensor required). If zoning is enabled the Word "ZONE" and the numbers "1" and or "2" will be shown in the LCD. If the optional zone 2 temperature sensor has been installed the second zone temperature will also be displayed and temperature control for that zone is also provided. Further information on zoning can be found on page 14 of this manual.

Economy Mode Indictor.

If the outside air temperature is suitable, the SMT-700 thermostat will use the cooler outside air (rather than the warmer inside air) to supplement the cooling capacity of your Air Conditioning system. If the outside air is very cool, then the SMT-700 thermostat may decide to stop the A/C system completely and only use this cooler outside air to cool the building. This reduces running costs while improving the indoor air quality. The SMT-700 thermostat will inform you that it is using outside air by showing the word "Economy" on the LCD. See page 13 for more detail on this function.

Auto Stop timer. (Manual Mode only) After Hours Run Timer (Commercial Mode Only)

The word "Timer" will be displayed whenever a SMT-700 thermostat timer function is active. The SMT-700 thermostat has a number of inbuilt timer functions that use this part of the display depending on which mode or installer function has been set. Whenever the words "TIMER" or "TIMER OFF" is displayed the SMT-700 thermostat is performing a timing function relevant to your mode of operation. These functions are described in multiple places throughout this manual in sections relevant to the specific operational mode of this function.

Current Program Overridden.
The SMT-700 thermostat LCD will display this word when the SMT-700 thermostat pre set program has been temporarily overridden. See page 7 & 10 for more details of this function.

A/C Fault Indicator.
The SMT-700 thermostat is capable of monitoring the safety of your air conditioning system, or an external device critical to the safe and correct operation of your air conditioner. If a fault is detected all heating and cooling calls are suspended to further protect the air conditioning system and the indoor fan may be locked to LOW speed (Installer set function). The SMT-700 thermostat can be turned OFF if required by pressing and holding the On/Off button for 2 seconds. If this symbol frequently turns on and off regularly or is displayed permanently then you will need to contact your air conditioning installer to check your system and reset any faults that have been detected.

SMT-700 Thermostat Fault Indicator.
As well as monitoring the status of the air conditioning system, the SMT-700 thermostat also monitors its own health. The "Spanner" symbol will show on the LCD to inform you that an internal fault has been detected. When a fault is detected all heating and cooling calls are suspended to protect the system from harm and to prevent run away heating or cooling conditions occurring. The indoor fan is locked to LOW speed to maintain a minimum level of ventilation during this fault condition. Depending on the fault you may or may not be able to turn your SMT-700 thermostat OFF with the On/Off Button. If this symbol is displayed on and off regularly or is displayed permanently you will need to contact your Air Conditioning installer to check your system and reset any faults that may have developed.

Troubleshooting

Symptom	Suspected Fault	Suggested remedy
Spanner symbol on in LCD	Internal SMT-700 thermostat Fault detected. Communication loss between main PCB and wall controller should be strongly suspected.	Re-boot Elegance by turning the MAIN PCB off (not the wall controller) – if fault persists Call Smart Temp service
Word "FAULT" shown on LCD	A/C fault detected	Call A/C system service
Temperature display seems inaccurate	Air from the wall cavity may be leaking into the rear of the thermostat / sensor enclosure.	Plug holes in wall with tape to prevent leaks
	External heat or cool source such as lamps, televisions or drafts from open doors affecting the accuracy of sensor.	Move lamps, vents or other sources of abnormal temperature away from sensors
	Sensor calibration may setting are incorrect	Call Smart Temp service for information on calibrating the air temperature sensor
Cannot enter heat or cool modes	SMT-700 thermostat set for Heating or Cooling only modes	Heating or cooling mode may not be available on your air conditioning system.
Fan sometimes stops and starts intermittently while heating is running	This may not be a fault. You air conditioning system may be running a de-ice maintenance function. The indoor fan is turned off during these events to prevent drafts being felt inside the building	If this occurs to often, an air conditioning fault may have occurred. Contact Smart Temp for information on this event
Fan speed changes frequently	This may not be a fault	Your SMT-700 is choosing the most energy efficient fan speed for the current conditions. Try selecting a speed manually with the fan button.
Fan On mode keeps the fan running 24 hours a day when in program mode, or the fan stops shortly after heating stops.	This is not a fault.	Your SMT-700 advanced fan management program has been customised by your installer to operate this way.
Wall controller has no display	Check air conditioning main fuse	Reset home A/C fuse Call Smart Temp service
	Faulty Wiring, fuse or SMT-700	Call Smart Temp service
Heating, Cooling or Air Conditioning System seems to runs all night.	Heating and or cooling temperatures set for typical day time or unachievable temperatures.	Set a lower heat temperature and/or a higher cooling temperature. Review manual on setting temperatures
	Fan set to Fan ON mode	Change fan mode to Auto. See page 12
Heating or cooling system seems to start before the scheduled start time	Optimised Start function may be on. This is an installer set function. See optimised start on page 14 above	Call Smart Temp service for information on turning this function off if required.
Some buttons do not appear to operate	Key board lock is on. See page 14 for more information on this function.	This is not a fault. Buttons or functions may be locked to prevent unauthorised tampering

Specifications

Input Voltage .... 24VAC / 240VAC (fused) selectable
Operating Temperature .... 0-50C (32 to 122F)
Operating RH .... 0-95% (non condensing)
Size .... 113 x 103 x 23mm
Display Size .... 74 x 55mm
Temp Sensors .... 10K NTC type 3
Accuracy .... +/- 0.3deg C @ 21 C
Display resolution .... 0.1 deg C
Control Range .... Off to 38c
Outside Air temp display range .... -8 ~ +60c
Back light .... Blue EL
Optimised Start method .... Time to Start Vs Temp Differential method
Communications Protocol .... Native RS485 - 150M max run with 4 core screened cable.
Warm Start .... Fan Coil >33c.
Heat run on.. Fan coil <27c.
De-Ice.. Fan coil < 21c (installer adjustable)
Fan speeds.. Based on difference between room and set temp
Economy function .... Outside air cooler >2.5c dampers only >5c suspend comp call
Approvals .... CE, C-tick

Warranty Information

This product is warranted to be free from manufacturing defects for 24months from the date of sale. Should a warranty claim be required contact Smart Temp Australia or place of purchase for a return authorisation number prior to returning any suspected faulty components.

Warranty is strictly return to base – cost of freight back to Smart Temp will be the responsibility of the sender. Smart Temp (or approved agent) will repair or replace the faulty item(s) at our discretion. Faults not warrantable will be charged a service fee.

Exclusions

This warranty does not include incidental or consequential damage that may result from using this equipment. Nor does this warranty cover abuse, rain or moisture damage or using this equipment outside of the quoted specifications.

Contact details

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This product has been manufactured by Smart Temp Australia.
Intellectual rights apply - all rights reserved.
This product is Patent Pending.

Specifications

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Operating Temperature 0-50C (32 to 122F)
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Control PCB 190 x 140 x 61mm
Temp Sensors - 10K NTC type II
Accuracy +/- 0.3deg C @ 25 C
Resolution 0.1 deg C
Control Range Off to 38c
Outside Air temp display range -8 ~ 60c
Back light - Blue EL
Optimised Start method - Time to Start Vs Temp Differential method
Display Size 74 x 55mm
Communications Protocol - Native RS485 - 150M max run 4 core cable.
Warm Start - fan Coil >33c.
Heat run on – Fan coil<27c.
Economy function >2.5c dampers only >6 suspend comp call
Relays (Maximum ratings - all supplied Voltage Free)
Fan Low - Max 10A 240V Inductive
Fan Med - Max 10A 240V Inductive
Fan High - Max 10A 240V Inductive
Heat 1 - Max 10A 240V Inductive
Heat 2 - Max 10A 240V Inductive
Cool 1 - Max 10A 240V Inductive
Cool 2 - Max 10A 240V Inductive
Damper 1 - Max 5A 240V Inductive Changeover
Damper 2 - Max 5A 240V Inductive Changeover
Fault - Max 1A 240V Inductive Changeover
Status - Max 1A 240V Inductive
Approvals CE, Ctick

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